

WHAT IS CLAIMED IS:

1. A system comprising:
an integrated circuit;
5 a printed circuit board (PCB) including at least one signal layer for conveying signals to and from the integrated circuit;
a power laminate including at least one power plane and at least one reference plane for providing core power to the integrated circuit, wherein the power laminate is separate from the PCB;
10 a voltage regulator circuit mounted upon the power laminate, the voltage regulator circuit configured for receiving a first voltage and providing a second voltage to the power laminate, wherein the second voltage is the core power voltage; and
a plurality of decoupling capacitors mounted upon the power laminate.
15
2. The system as recited in claim 1, wherein the PCB is not configured for providing core power to the integrated circuit.
3. The system as recited in claim 1, wherein the integrated circuit is mounted
20 upon a first side of the PCB, and wherein the power laminate is mounted upon a second side of the PCB.
4. The system as recited in claim 1, wherein the power laminate is arranged between the integrated circuit and the PCB.
- 25 5. The system as recited in claim 4, wherein the power laminate includes an aperture for allowing signals to pass from the PCB to the integrated circuit.

6. The system as recited in claim 1, wherein the power laminate is mounted to the PCB by soldering.
7. The system as recited in claim 6, wherein the power laminate includes a ball-grid array for mounting to the PCB.
8. The system as recited in claim 1, wherein the power laminate includes a land-grid array for mounting to the PCB.
9. The system as recited in claim 1, wherein the power laminate includes a dielectric layer arranged between the power plane and the reference plane.
10. The system as recited in claim 1, wherein the power laminate includes a plurality of power plane pairs, wherein each of the power plane pairs includes a power plane and a reference plane.
11. The system as recited in claim 10, wherein each of the power plane pairs is in an electrically parallel configuration with respect to each of the plurality of power plane pairs.
12. The system as recited in claim 1, wherein the power laminate includes a connector for coupling a power source to the power laminate.
13. The system as recited in claim 1, wherein the voltage regulator circuit is a switching voltage regulator.
14. The system as recited in claim 13, wherein the voltage regulator circuit includes:
a connector for connecting a power source to the voltage regulator circuit;

a slow inductor for storing energy and delivering current to a load coupled to
the voltage regulator circuit;
a first switch connected between the connector and the slow inductor; and
a second switch connected between the slow inductor and the reference plane;
5 wherein the voltage regulator circuit is configured to close the second switch
and open the first switch if the amount of current the slow inductor
delivers to the load exceeds an amount of current demanded by the
load.

- 10 15. The system as recited in claim 1 further comprising a voltage regulator
module, the voltage regulator module including the voltage regulator circuit.
16. The system as recited in claim 15, wherein the power laminate includes a
stiffener for mounting the voltage regulator module.
- 15 17. The system as recited in claim 1, wherein the decoupling capacitors are
surface mounted capacitors.
18. A method for delivering power to an integrated circuit, the method
20 comprising:
providing a printed circuit board (PCB), wherein the PCB includes a plurality
of signal paths;
providing an integrated circuit, the integrated circuit including a plurality of
signal connections, wherein each of the signal connections is
25 electrically coupled to one or more of the plurality of signal paths; and
providing a power laminate for supplying core power to the integrated circuit,
wherein the power laminate is electrically coupled to the integrated
circuit, wherein the power laminate includes at least one power plane
and one reference plane, a voltage regulator circuit, and a plurality of

decoupling capacitors, and wherein the power laminate is separate from the integrated circuit.

- 5
19. The method as recited in claim 18, wherein the PCB is not configured for providing core power to the integrated circuit.
20. The method as recited in claim 18 further comprising mounting the integrated circuit upon a first side of the PCB and mounting the power laminate on a second side of the PCB.
- 10
21. The method as recited in claim 18 further comprising arranging the power laminate between the integrated circuit and the PCB.
22. The method as recited in claim 21 further comprising providing at least one aperture in the power laminate for allowing signals to pass from the PCB to the integrated circuit.
- 15
23. The method as recited in claim 18 further comprising mounting the power laminate to the PCB by soldering.
- 20
24. The method as recited in claim 23, wherein the power laminate includes a ball-grid array.
25. The method as recited in claim 18, wherein the power laminate includes a land-grid array for mounting the power laminate to the PCB.
- 25
26. The method as recited in claim 18, wherein the power laminate includes a dielectric layer arranged between the power plane and the reference plane.

27. The method as recited in claim 18, wherein the power laminate includes a two or more plane pairs, wherein each of the plane pairs includes a power plane and a reference plane.

5 28. The method as recited in claim 27, wherein a first of the two or more plane pairs is in an electrically parallel configuration with respect to a second of the two or more plane pairs.

29. The method as recited in claim 18, wherein the power plane laminate includes
10 a connector for coupling a power source to the power laminate.

30. The method as recited in claim 18, wherein the voltage regulator circuit is a switching voltage regulator.

15 31. The method as recited in claim 30, wherein the voltage regulator includes:
a connector for electrically connecting a power source to the voltage regulator;
a slew inductor for storing energy and delivering current to a load coupled to
the voltage regulator circuit;
a first switch connected between the connector and the slew inductor; and
20 a second switch connected between the slew inductor and the reference plane;
wherein the voltage regulator circuit is configured to close the second switch
and open the first switch if the amount of current the slew inductor
delivers to the load exceeds an amount of current demanded by the
load.

25

32. The method as recited in claim 18, wherein the power laminate includes a voltage regulator module, the voltage regulator module including the voltage regulator circuit.

